Advantages of using computer graphics in the field of design

Mukhamedov Umarkhon Sobitovich[1], Umirzokov Rakhmatilla Rakhmonberdiyevich[2]

[1,2]Senior lecturer of department "Informatics and management " National Institute of fine arts and design named after Kamoliddin Behzod, Uzbekistan

Email: muxamedov_u@umail.uz

ABSTRACT

The use of computer graphics in the design area will be a great deal of convenience for the owners of this field. Graphics play a decisive role in design and advertising. This article discusses some of the uses of computer graphics in design.

Keywords: design, advertising, computer, graphics, color model.

1. INTRODUCTION

Graphic design, being a rather complex structure, penetrates into all spheres of activity of modern society, helps it grow and develop not only in the cultural, but also in the technical aspect. The origin of design is closely related to the emergence of writing and the creation of handwritten books. The beginning of the era of printing has contributed to its wide distribution throughout the world. Nevertheless, the history of graphic design totals only about a hundred and a few years, since its birth as a science occurred during the industrial revolution of the late XIX century, and reflects the entire course of scientific and technological progress. Graphic design combines art and technology in a single creative process. In the XX century, a computer was invented, which later became one of the most important tools of the artist and opened up new horizons for creativity, thereby taking the designer to a new level. Not a single self-respecting publication (whether it is an article or a book) on graphics does not bypass the discussion of the features of the presentation of graphic information in a computer. And this is not such a tradition, this is fundamental knowledge that should not be neglected.

2. SIGNIFICANCE OF THE SYSTEM

There are two fundamentally different ways of representing graphic information in a computer: raster and vector graphics. In vector graphics, an image is represented as a set of objects (primitives), the geometry of which is described by mathematical formulas. This set includes simple geometric shapes: points, lines, arcs, polygons, ovals and some other shapes. Thus, it becomes possible to store only the coordinates of the nodes of the primitives and their properties (color, communication with other nodes, etc.).

Here are some areas of application for vector graphics: logos, emblems, brand names, advertising labels, diagrams, drawings, clothing designs, and much more. The main advantages of vector graphics: Good scalability, Small image, file sizes, High processing speed. Low computing requirements and only two fundamental shortcomings: The inability to create realistic images. Geometry Description Complexity. In raster graphics, any image is represented as a set of points of the same size - a raster, each of which is described separately. These elementary image particles are called pixels (from the English "picture cell"). A pixel description is a description of its color. Many small pixels at a certain distance are perceived as an integral image, and not as an array of points. The more of them, the visually better image and larger file size. Raster representation is usually used for images with a large number of details or shades. In the form of a set of points, you can imagine a landscape picture, a photo portrait, a digitized drawing and much more.

3. LITERATURE SURVEY

When editing raster graphics, its quality may change. Changing the size of such images in any direction usually affects the quality: when reducing, small details are lost, when increasing, the sharpness and brightness of the image deteriorate. There may also be a loss of quality when turning and tilting. The properties of the vector and the raster complement each other: the strengths of one way of describing are the weaknesses of another and vice versa. The description of the dots of the bitmap image is information about the color and brightness of the dots in binary form. A color model is a certain algorithm (or set of rules) for interpreting and processing point codes. For radiating objects (TVs, computer monitors, video projectors, and many other graphic output devices), the additive synthesis principle is used when the desired color is formed by mixing the basic color shades.

The most famous additive type model is the RGB model. Its name is formed by the first letters of the basic color coordinates Red (red), Green (green), Blue (blue). By mixing these three primary colors in a certain ratio, you can reproduce most of the colors perceived by man.

Getting colors as a result of additive mixing:

Green + Red = Yellow

Green + Blue = Cyan

Blue + Red = Purple

Blue + Red + Green = White

No light = Black

The color of non-luminous objects (paper prints) is formed by the subtractive principle of synthesis, that is, by subtracting various color components from the light reflected by white paper. Removing all components produces a black color.

The colors of one model are complementary to the colors of another model. Complementary colors are colors that, in their totality, produce pure white, pure black or a shade of gray. Complementary for red is cyan, since cyan is obtained by mixing green and blue. Additional for green is magenta (magenta = red + blue), for blue - yellow (yellow = red + green).

For each point in the image of the Bitmap model, only one binary bit is allocated. That is, it is possible to imagine only two pixel states. Typically, such states are black and white, therefore, the images presented in this model are called black and white or monochrome (Fig. 3). The model does not make it possible to present smooth tone gradations. Sometimes called Black and White, LineArt.

4. METHODOLOGY

The Grayscale model is usually used to store information about grayscale images (represented by different shades of gray). In it, eight binary bits (one byte) are allocated for each point of the picture, so we get 28 = 256 possible gradations of gray. A value of zero corresponds to black; the maximum value of the codeword (255) is white. Intermediate values encode various shades of gray. Indexed Color Model As in the Grayscale model, each image point in the Indexed Color model (Fig. 5) is represented by a codeword eight bits long. But it does not record gray gradation information, but color data. The set of all available colors forms a palette of 256 elements. This model can be called Paletted, 256 Colors, Web Colors. RGB model. The RGB model is the most popular way to present graphics. In this system, any color is formed by combining red (Red) green (Green) and blue (Blue) colors of various intensities. The zero value of all components corresponds to black color (lack of luminosity), and white color gives a mixture of values of the limiting intensity. Since there are three color coordinates in the RGB system (8 bits are assigned to the description of the codes of each), 24 binary bits are allocated per pixel. It is sometimes said that the color depth in this system is 24 bits. This allows us to present over 16 million colors.

In the HSB model, all colors are determined by three coordinates: Hue, Saturation, and Brightness. The name of the model is formed by the first letters of the English names of color coordinates. The undoubted advantage of the HSB system is its independence from the equipment. A color tone or hue (Hue) is a spectrally pure color of a specific wavelength, such as pure red or pure green. Brightness characterizes the intensity, color energy. A change in brightness can be thought of as a mixture of pure tone and black. The high content of black makes the color shaded, non-intense. With a decrease in the percentage of black, the illumination increases. The sunbeam is an example of bright light, the glow

coming from a firefly has a very low brightness. Black color has zero brightness, and white color - absolute. Saturation describes the purity of color.

5. EXPERIMENTAL RESULTS

The same tone can be dim or saturated. A change in saturation can be thought of as a dilution of pure color with white. The higher the white content, the more faded the color becomes. CMY and CMYK models. The CMY model describes a method of obtaining colors not by adding, as in RGB, but by subtracting the basic color coordinates from white. Therefore, the CMYK model is called subtractive. In this model, the supporting colors are cyan (Cyan, C), magenta (Magenta, M), and yellow (Yellow, Y). The CMYK color model is used in printing to form images designed for printing on paper.The synthesis of colors in the CMY system and an explanation of why this model takes the form of CMYK was discussed a little above.

6. CONCLUSION AND FUTURE WORK

In many graphic packages, color coordinates are considered as dyes that are applied to the surface of the paper, so the intensity of each coordinate is measured as a percentage from 0 (no paint) to 100 (maximum paint intensity).The general recommendations for choosing a color model are as follows: for displaying on a computer monitor or TV screen, the RGB system is better suited, for transferring to a printer, the CMYK system should be preferred.

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